

## What Is Claimed Is:

1. A method for reconstructing topological information for a mesh, said mesh comprising a polygonal soup of triangles with sides and vertices,  
5 said method comprising the steps of:  
building vertex and edge connectivity data;  
finding duplicates of vertices;  
removing said duplicates of vertices; and  
realigning strips of triangles without common  
10 vertices.
2. The method as set forth in claim 1 wherein said step of building vertex and edge connectivity data comprises the steps of:  
generating a representative index;  
15 creating a vertex-neighbor table; and  
building an edge-neighbor table.
3. The method as recited in claim 2 wherein said step of generating a representative index comprises eliminating at least one duplication of  
20 vertices.
4. The method as recited in claim 2 wherein said step of removing duplicate vertices comprises:  
searching for unconnected sides of triangles;  
searching for duplicates of the vertices at  
25 the ends of said unconnected sides;  
replacing all duplicate vertices with original vertices;  
adding triangles connected to the duplicate vertices to said original vertices; and

rebuilding said edge-neighbor table for all triangles connected to said original vertices.

5. The method as set forth in claim 4 wherein said step of adding triangles comprises  
5 splitting the triangles into new smaller triangles.

6. The method as set forth in claim 4 wherein said step of searching for duplicates comprises searching in said vertex-neighbor table for the closest vertex.

10 7. The method as set forth in claim 6 wherein said step of searching for the closest vertex comprises using an OctTree structure.

8. The method as set forth in claim 6 wherein said step of searching for the closest vertex  
15 comprises using a log2-complexity search method.

9. The method as set forth in claim 8 wherein said log2-complexity search method comprises using an OctTree structure.